body of the work, *i.e.* in Prof. Doolittle's own words, we find these consist of two pairs in which there is no evidence of motion; five pairs in which change is doubtful; five pairs in which some change is probable; seven pairs where the change is less than 1°·0 per annum; six pairs where the change is just over 1°·0 per annum; two pairs where it is approximately 2°·0 per annum; two pairs fairly rapid binaries; one pair, Hough 212, with a period of 5·7 years.

The last five only can be brought under the above phrase.

There are two rather serious errors in identification: Hough 198 should be B.D.+16°.4896, not WB (2)xxiii.195, the declination of which is 42°, not 16°; Hough 507 should be WB(2)iv.151, declination 37°, not WB(2)iv.154, declination 32°.

NOTES.

We regret to see the announcement of the death on July 20 of Mr. Arthur Lister, F.R.S., distinguished particularly for his researches on the Mycetozoa. Mr. Lister was seventy-eight years of age, and was elected a Fellow of the Royal Society in 1898.

Sir John Banks, first president of the Royal Academy of Medicine, Ireland, and a leading authority on mental diseases, died on July 16 at ninety-seven years of age.

The eighth meeting of the Association of Economic Biologists will be held at Edinburgh on Tuesday, Wednesday, and Thursday, July 28, 29, and 30, under the presidency of Mr. A. E. Shipley, F.R.S., who will deliver a presidential address "On Rats and their Parasites" on July 28.

We learn from the Journal of the Meteorological Society of Japan that the death of H.I.H. Prince Yamashina occurred on May 2 at thirty-one years of age. The late Prince had deep interest in meteorology and allied sciences. On his own account he established the Mount Tsukuba meteorological observatory and two base stations in 1901, and published a series of "Ergebnisse der meteorologischen Beobachtungen auf dem Tsukubasan." He made several valuable researches in meteorology and seismology, and designed a number of excellent instruments.

Dr. Ludwig Mond, F.R.S., has offered to the Reale Accademia dei Lincei a biennial international prize of 400*l.*, to be called the Stanislao Cannizzaro prize, for chemistry and physical chemistry. The amount necessary for providing the prize, together with taxes and expenses, is to be given by the donor in the form of Italian Consols, while the conditions of award have been placed in the hands of the president of the Academy, in consultation with Dr. Mond and Senator Cannizzaro.

The Paris correspondent of the *Times* states that a Society of the Observatories of Mont Blanc has just been regularly constituted, with a board of directors largely chosen from the Academy of Sciences, for the more systematic continuation of the work begun by the late M. Janssen and M. Vallot. The society has decided to place the Vallot and Janssen observatories under the direction of M. Vallot. With this object the latter has given his establishment to the society just formed—a purely scientific association—which appeals for members and funds. The secretary is Comte de La Baume-Pluvinel, 9 Rue de La Baume, Paris.

We are informed that the optical illusion observed by Dr. T. Terada, Tokyo, and described on p. 255 of our last number, has been previously observed and described. In the Proc. Roy. Soc., Edin., 1878–79, there is an account of some experiments on this illusion. Like Dr. Terada, the writer first observed it after looking at moving water, but in his case it was a quickly flowing stream; on afterwards looking at the gravel bank a stream of gravel seemed to flow slowly through it in a direction the opposite of that of the water. A number of experiments are described in the paper referred to on the effect of looking at rotating discs with black and white radii, and moving bands of paper with cross-lines, the eyes being afterwards directed to a mottled surface on which the reverse movements referred to appeared. These spectra were shown to be entirely stopped when a straight line was drawn across the surface.

An international exhibition and congress of the applications of electricity will be held on September 14–20 at Marseilles. The object of the congress is the consideration of the technical, commercial, and administrative problems which have arisen in recent years. These questions will be treated in reports prepared by well-known authorities, and the reports will be submitted to the congress for discussion, and published subsequently. The business of the meeting will be transacted in nine sections dealing with, respectively, the framing of regulations; the construction and protection of electric wiring; technical and commercial workings; lighting and domestic applications; applications to industry, mines, traction, and agriculture; electro-chemistry and electro-metallurgy; telegraphy and telephony; instruction and measurements; and applications to hygiene and medicine. Numerous papers, none of which, we understand, is the work of a British authority, will be discussed in each section. Prof. Maurice Lévy will be the president of the congress. There are four general secretaries, MM. Armagnat, Chaumat, and Dusaugey, and Prof. Zimmern, who may be addressed at 63 Boulevard Haussmann, Paris.

Commander Peary departed on July 17 from Sydney, Nova Scotia, on the *Roosevelt*, on his voyage to the North Pole. A *Times* correspondent reports that Commander Peary has summarised the main features of his programme thus: First, the utilisation of the Smith Sound route, the advantages of which are a land base 100 miles nearer the Pole than is to be found at any other point of the entire periphery of the Arctic Ocean, a long stretch of coast-line upon which to return, and a safe and (to Commander Peary) well-known line of retreat in the event of any mishap to the ship, independently of assistance. Secondly, the selection of a winter base which commands a wider range of the central polar sea and its surrounding coasts than any other base in the Arctic regions. Cape Sheridan is practically equidistant from Crocker Land, from the remaining unknown portion of the north-east coast of Greenland, and from Peary's "Nearest the Pole" of 1906. Thirdly, the use of sledges and Esquimaux dogs. "Man and the Esquimaux dog," Commander Peary observes, "are the only two machines capable of such adjustment as to meet the wide demands and contingencies of Arctic travel. Airships, motor-cars, trained Polar bears, &c., are all premature, except as a means of attracting public attention." Fourthly, the use of the Whale Sound Esquimaux for the rank and file of the sledge party.

The president of the Local Government Board has authorised for the current year the following researches in connection with the annual grant voted by Parliament in aid of scientific investigations concerning the causes and processes of disease:—(1) A further inquiry by Dr. M. H. Gordon into the character and differential tests for the micro-organisms found in the throats of patients suffering from scarlet fever. (2) An investigation of protracted and recurrent infection in diphtheria. This will be undertaken by Dr. Theodore Thomson and Dr. C. J. Thomas. The bacteriological part of the investigation will be undertaken by the Lister Institute. (3) An investigation of protracted and recurrent infection in enteric fever. This will be undertaken by Dr. Theodore Thomson, in conjunction with Dr. Hedingham, of the Lister Institute. (4) Investigations by Dr. W. G. Savage into the presence of paratyphoid bacilli in man, the differentiation of streptococci in goats, and the bacteriological measurement of pollution of milk. (5) A statement of the results of the bacteriological examination of more than 7,000 samples of milk from different parts of the country, made by Prof. Delépine. (6) An investigation into flies as carriers of disease, by Dr. Copeman,, F.R.S., with the co-operation of Prof. Nuttall, F.R.S. (7) An inquiry into the condition of flock beddings, by Dr. Farrer. The bacteriology and biology of bedding (especially in relation to vermin), which will be undertaken in connection with this inquiry, will be superintended by Prof. Nuttall. (8) A statistical inquiry into the social incidence of disease will also be begun, the prevalence of varicose veins and of hernia under different social conditions forming the first subject of inquiry under this head. This will be undertaken by Dr. Basil Cook. Announcements of further investigations for the current year will be made at a later date.

The Fourth International Fishery Congress will be held under the presidency of Dr. Hermon C. Bumpus at Washington, D.C., U.S.A., on September 22–26, to deliberate on important matters relating to fishing and fish culture, and to submit propositions for the benefit of the fisheries to Governments and to State, provincial, and local authorities. The congress will be organised and conducted in conformity with the decisions for the regulation of the international fishery congresses decreed in Paris in 1900. The membership will consist of Government, State, and provincial representatives, delegates from home and foreign societies, corporations, invited persons, and persons who express a wish to take part in it. In response to invitations from the United States Government, twelve national Governments have signified already their intention to be represented officially, and delegates have been appointed by the governors of many of the States of the United States. Very few nations have indicated formally their inability to participate officially, and the congress promises to be really representative in character. Among the important subjects to be discussed may be mentioned: commercial fisheries; matters affecting fishermen and the fishing population; legislation and regulations relative to fishing, fish culture, pollution of waters, and obstruction of waters; international matters affecting fisheries; aquiculture; acclimatisation; fishways and fish ladders; biological investigation of the waters and their inhabitants; diseases and parasites of fishes, crustaceans, molluscs, and other water animals; and angling and sport fishing. Suitable arrangements will be made for the entertainment and instruction of the members in Washington and at the other places visited, and an opportunity will be given for visits to places of general interest. All communications and inquiries before September 20 should be addressed to Dr. Hugh M. Smith, the secretary-general of the congress, Bureau of Fisheries, Washington, D.C.

The morphology and physiology of the gephyreans of the family Priapulidæ are discussed by Mr. L. A. Moltschanov in a paper published in the June issue of the Bulletin of the Imperial Academy of St. Petersburg. The author regards the genus Priapuloides as intermediate between Priapulus and Halicryptus.

Richard Carew (1555–1620) forms the subject of the second instalment of "Early British Ornithologists," by Mr. W. H. Mullens, now being published in *British Birds*. In connection with this we may perhaps be permitted to direct attention to the inconvenience of that title as the designation of a serial. In quoting we refer, for instance, to Mullens, *British Birds*, vol. ii., p. 42, while we should in like manner refer to Yarrell, *British Birds*, vol. i., p. 10. Who is to know in such cases whether it is to the serial or to a separate work that the quotation refers?

A second report on the copepod crustaceans of the Irish Atlantic slope, by Mr. G. P. Farran, has just been issued in "Scientific Investigations, Irish Fisheries," for 1906, No. ii. The list given is mainly the result of a number of deep-water tow-nettings taken in 1904–5, and may be regarded in the main as a contribution to our knowledge of the plankton of the zone between 600 and 1000 fathoms. No. viii. of the same issue is devoted to reports concerning the obstacles to the ascent of young eels up the Irish rivers and the illegal capture of the fry.

The Royal Scottish Museum has issued a general guide-book to the collections, at the price of one penny. Considering that it comprises only 63 pages and includes the artistic, ethnographical, natural history, and technical collections, the notices of each group are necessarily of the briefest. Although the type of the main text is small—too small, we think, for a number of persons who ought to avail themselves of the guide—the "catch-words" are printed in heavy block type well calculated to attract the attention of the reader.

We are indebted to Mr. L. M. Lambe for a copy of a paper from the first volume of the third series of the Transactions of the Royal Society of Canada on the remains of a new type of crocodile from the Cretaceous formation of the Judith river. This crocodile, for which the barbarous name *Leidyosuchus canadensis* is suggested, is a broad-nosed form recalling Diplocynodon, but with the splenial included in the short mandibular symphysis, as in some of the Goniopholididæ. Possibly it may be a direct descendant of the latter—an idea supported by the fact that several members of the Judith river fauna present a Jurassic *facies*.

The ninetieth volume of the *Zeitschrift für wissenschaftliche Zoologie* is published in a single issue of 677 pages. with 43 plates, of which several are coloured. All the eighteen papers are devoted to invertebrates. Among these. special reference may be made to one by Mr. F. Blochmann on the taxonomy and geographical distribution of brachiopods. The paper is illustrated with a large map, in colour, showing the distribution of Liothyrina, a genus most numerously represented in the neighbourhood of the Gulf of Mexico on the one side of the Atlantic, and the Spanish and north-west African coast, together with the Mediterranean, on the other. This distribution seems to confirm the theory of the existence until comparatively recently of a belt of shallow water across the mid-Atlantic. Further, the distribution of this and other genera indicates, in the author's opinion, the existence during Tertiary times of a communication between the Atlantic and the Indian Ocean by way of the isthmus of Suez.

The results of a number of experiments with regard to the inheritance of colour and the head-crest in canaries undertaken at the Carnegie Institution of Washington are recorded by Mr. C. B. Davenport in publication No. 95 of that body, the report being illustrated with three coloured plates. After referring in some detail to the introduction and cult of the canary as a cage-bird, the author observes that in some respects this species, owing to the comparatively short time it has been under the influence of domestication, is better adapted for investigations of this nature than animals which have been longer subject to human influence. As regards colour, it appears that the domesticated yellow breeds are derived from the original "green" breed by the loss of the black, and that it consequently carries a mottling factor which leads to the production of mottled hybrids when crossing takes place with a pigmented canary or a finch. Although such hybrids do not display a fixed pattern, the degree of their mottling is heritable. Further, the principle of localisation of the unit of complex plumage-colour must be recognised, as is exemplified by the restriction of a red patch to the sides of the face in hybrid canary-goldfinches.

ON the occasion of succeeding to the presidency of the Royal Microscopical Society for the second time, Lord Avebury delivered an address on seeds, with special reference to British plants. The president confined himself to a synopsis of the forms occurring in the British dicotyledonous orders and indicated the biological significance of the various devices met with. The paper is printed in the June number of the society's journal.

FROM Messrs. Gallenkamp and Co., London, a new catalogue of museum jars and window aquarium apparatus has been received. It also contains an illustrated list of Smedley's models. The models of Palæozoic seeds and cones, which are on view in the Hall of Science at the Franco-British Exhibition, have met with the universal approbation of botanists; the models of cryptogamic plants, flowers and seeds, and of invertebrates, are less generally known. They are all modelled in hard wax on a rigid foundation.

THE editorial article in the June number of *Tropical Life* deals with the arrangements made for insurance against gales, hurricanes, and earthquakes as applicable to Jamaica and other West Indian islands. These permit of the insurance of such crops as limes, cocoa, and cocoanut-trees. Cotton can be specially insured against damage during the hurricane months July to October. In the same journal Mr. F. T. Crawley discusses the value of manures for lands planted with sugar-canes. With reference to the experience of planters in the Hawaiian islands, it is stated that fertilisers containing ammonia, phosphoric acid and potash are found to lead to an increased proportion of sucrose.

HAVING for twenty years pursued the study of the resinous substances found in plants, Dr. A. Tschirch laid before the Chemical Society of Switzerland, in response to its invitation, a paper treating of the chemistry and biology of plant secretions, with special reference to the resins. The author classifies the resinous substances according to the various products that are associated with the pure resin, and distinguishes *tannol resine, resinol resine,* and *harzsaüre,* also such extraneous substances as ethereal oils, gums, &c. With reference to their systematic value, it is observed that while the orders Dipterocarpaceæ, Burseraceæ and others are characterised by definite groups of resins, other resins occur in plants quite unrelated. But it is suggested that for distinguishing between certain resin-producing species, chemical tests based on the secretions might be devised. The lecture has been published in pamphlet form.

THE results of an expedition in the Atlas Mountains of Morocco, made by M. Louis Gentil in 1906–7, are given in *La Géographie* for March. From the data obtained, a valuable map has been drawn up, indicating the main geological features of the High Atlas Mountains from the west coast to the region of Demnat. In an article accompanying the map, M. Gentil discusses the various difficulties encountered in obtaining accurate observations, and emphasises the utility of geological methods in mountain exploration. Information has been obtained of the hitherto little-known regions of Ounila, Anr'mer, Sous, and Siroua, the characteristic geological structure of the last being especially noticed. In an orographical sketch of Morocco, the regions of the High Atlas, Middle Atlas, and Anti-Atlas are distinguished, and the main features shown on a map.

MR. W. H. WHEELER has prepared a paper on the physical characteristics, tides, currents, and fisheries of the North Sea (J. D. Potter, 145 Minories). In the first section an account is given of the pre-Glacial condition of the North Sea, the main features being a deep fiord in the north branching out of the Atlantic, a large estuary south of the Wash, and an isthmus joining England to the Continent. In the post-Glacial period the mouth of the fiord between Durham and Yorkshire became blocked up, sandbanks were formed, and the channel which now forms the Strait of Dover was scooped out. This section of the paper includes also a description of the Dogger Bank, and illustrations of the depression of the land on the east coast of England and in the Low Countries. The making of new land by the deposit of glacial drift covered by alluvium is discussed, examples being drawn from the coasts of Belgium and Holland. The opposite effect of erosion is observed along the English coasts. An account is given of the Orkney and Shetland Islands, and the east coasts of Scotland and England are described in detail. The progress of the tidal wave in the North Sea is traced, velocities and range of the tides being given, with a table showing the effect of winds on the tides. As the result of experiments made by the Fishery Board of Scotland, the general drift of the surface currents in the North Sea was shown to be southerly down the coasts of England and Scotland, then south-east round the Dogger Bank, and, finally, east-north-east to the Skager-rack. Statistics of the fishing industry are given in the section dealing with this subject.

THE first application of the Kimberley method of diamond washing to the concentration of alluvial tin is described by Mr. H. D. Griffiths in the *Mining Journal* of July 11. The new method has been adopted at Kuils River tin mines, Cape Colony, and has given such exceptional results as regards efficiency and economy that the sluicing methods formerly in use on the property have now been discarded.

THE British Fire Prevention Committee has issued a red book (No. 127) on fire tests with fire extinguishers. The series of tests with the "Diamond" dry powder extinguisher showed that hand powder fire extinguishers, as a class, if applied with skill, can often be usefully employed in the incipient stages of small fires. The various tests undertaken with petrol point to the conclusion that, with a volatile liquid of this nature giving off a highly inflammable vapour, the powder extinguisher is only efficient when the area of the fire is small or narrow. The efficiency of powder extinguishers depends materially on the closeness of range, the position of the operator's shoulder, and on a certain knack or dexterity in handling the appliance. The action of powder extinguishers would appear to be largely mechanical.

WE have received from the Deutschen Gesellschaft zur Bekämpfung des Strassenstaubes a pamphlet of thirty-five pages, in which Colonel Layriz has compiled from the scattered notes in technical journals a report on the methods at present in use to obviate the dust nuisance on roads. The data collected tend to show that efficacious methods are now available for obviating the formation of dust in densely populated cities and in the vicinity of summer resorts, but that the unavoidable cost renders it impossible to apply such methods, except by degrees, so as to make country high-roads free from dust.

THE June number of the Journal of the Franklin Institute is of special interest to metallurgists. Mr. E. A. Custer has a copiously illustrated article describing the casting of pipes in permanent moulds that the hottest iron attainable from the cupola does not destroy. The method is one deserving careful attention, for it has long been the dream of every foundryman whose trade requires a large number of duplicate castings to make such castings in moulds that would not merely survive the process, but would also produce castings that would be marketable and be easily machined. Mr. G. B. Heckel reviews the methods in use for protecting iron and steel against corrosion, and Mr. H. P. Cochrane discusses engineering practice as applied to the handling of fuel at power stations.

NUMEROUS attempts have been made to obtain ammonia from peat, but the difficulties of dealing with a substance which often contains 90 per cent. of water have hitherto proved insuperable, and none of the methods has survived the experimental stage. We have received an account of the Woltereck process, stated by the inventor to have overcome successfully all these difficulties. The peat is slowly decomposed at a regulated temperature by means of a blast of air charged with water vapour, and forms "paraffin tars," acetic acid, and ammonia. These pass successively through a scrubber to remove tar, an alkali tower containing a hot solution of caustic soda or milk of lime to absorb the acetic acid, and finally through an acid tower, where the ammonia is taken up by sulphuric acid. The tar on distillation yields a wax said to be worth 4*l.* a ton; the acetate is to be utilised for preparing either acetic acid or acetone. The ash of the peat is a saleable manure, and contains potash, lime, and phosphoric acid. It is estimated that the cost of producing the sulphate of ammonia will not be more than 5*l.* 8*s.* per ton, and, as the present market price is 12*l.*, a considerable profit is anticipated.

THE officiating director-general of observatories (Mr. J. H. Field) has issued a memorandum, dated June 9, on the meteorological conditions prevailing in the Indian monsoon region before the advance of the south-west monsoon of 1908, with an estimate of the probable distribution of the monsoon rainfall. Account is taken, as usual, of the recent conditions over a wide area, including parts of Australia, Africa, Siberia, and South America, and all the available data have been analysed by the method developed by Dr. Walker and described by him in his forecast for last year. The result indicates, *inter alia,* that the total rainfall for the whole of India during the period from June to September will probably be nearly normal or in slight defect.

WE have received part ii., vol. xx., of the Memoirs of the Indian Meteorological Department, containing kite observations made by Mr. J. H. Field at Belgaum (Bombay Presidency) during the pre-monsoon and monsoon periods in 1906, in continuation of those begun at Karachi in 1905 (published in part i.). One series was made in May, in which month the normal weather is dry and hot; the records, which are diagrammatically shown, indicated no marked increase in wind velocity up to 1300 metres, the maximum height reached. Temperature gradients were strong, by day always considerably above the adiabatic rate for unsaturated air. Comparatively humid air extended on different days to a height of 600–1100 metres; above it exceedingly dry air was met with. The other series was made in August and September, when the weather was comparatively cool, with frequent rain, especially in September. The wind velocity was, on the whole, nearly uniform up to the maximum height reached, 2500 metres. The temperature gradients were considerably smaller than in May and, except near the surface, always below the adiabatic rate. The upper limit of humid air had risen by about 1000 metres since May.

WITH reference to the article on recent developments in electric lamps which appeared in our issue of June 25, we are informed by the General Electric Co. that the statement to the effect that tungsten lamps for high voltages, 200 and above, have not yet been commercially introduced is not correct, as they have had these lamps on the market since the commencement of April. This firm is now in a position to deliver Osram and Wolfram lamps up to 260 volts pressure in 50 and 100 candle-power sizes and lamps for 100 to 130 volts in 25, 30, 50, and 100 candle-power sizes. In addition to this, 25-volt lamps are made for 10, 16, and 25 candle-power, and there is a large demand for this type of lamp for private plants and for alternating-current circuits where advantage can be taken of the possibility of transforming down the voltage. The company sends us two very well arranged catalogues setting out the advantages and possibilities of these lamps.

VOL. v. of Contributions from the Jefferson Physical Laboratory of Harvard University consists of reprints of ten papers by the staff and students which appeared in the Proceedings of the American Academy, the *Physical Review,* &c., during the year 1907. Of those not already noticed in these pages may be mentioned a paper by Mr. G. W. Pierce on "Crystal Rectifiers for Electric Currents and Electric Oscillations," part i., in which the author follows up and explains the fact recently discovered by General Dunwoody that a crystalline mass of carborundum between two electrodes will act as a receiver for electric waves when used either with or without a cell in series with it. This property is shown to be due to carborundum not following Ohm's law, but conducting better for high than for low voltages. It thus falls into line with other detectors of electric waves investigated by Profs. Braun and Strientz. The author is not yet prepared to advance any theory as to the cause of the phenomenon, but considers that there is sufficient evidence to show that it is not of thermoelectric origin.

MERCURY has usually been regarded as completely insoluble in water and other solvents. It has, however, a definite vapour pressure, although a very low one at ordinary temperatures, and since no gas is completely insoluble in water, it appeared not improbable that this vapour should prove to be slightly soluble in water. This question is dealt with by Mr. A. Christoff in the current number of the *Zeitschrift für physikalische Chemie* (June

30), the experiments described being conceived with much ingenuity. The reducing action of mercury upon a solution of gold chloride was relied upon for detecting the extremely minute amounts of mercury involved, great care being taken to eliminate disturbing influences. The solvent action of water, benzene, nitrobenzene, and alcohol on mercury is clearly proved, and it was also shown that the effects observed could not be attributed to the formation of an oxide or hydroxide of mercury.

THE *Bio-Chemical Journal* for June (iii., No. 5) is mainly occupied with papers by Prof. P. W. Latham on the synthesis of protein. Taking the results of Schutzenberger, obtained by the hydrolytic decomposition of egg-albumin with baryta, the author analyses them and attempts to reconstruct a formula for albumin.

A THIRD edition of "Determination of Radicles in Carbon Compounds," by Profs. H. Meyer and J. Bishop Tingle, has been published by Messrs. John Wiley and Sons, of New York. Messrs. Chapman and Hall, Ltd., publish the book in this country at the price of 5*s.* 6*d.* net. The new matter, running to fifty-five pages, has been placed at the end of the volume in the form of an appendix, and copious cross-references have been provided.

WE have received a copy of a new periodical devoted to scientific subjects, and entitled the *Scientific Monthly*, an illustrated journal of science. There are contributions dealing with electrical, astronomical, chemical, and microscopical subjects, and numerous notes on scientific questions of current interest. The articles are of a general informative character and are illustrated. The magazine, the price of which is 3*d.*, is published by Mr. Arthur N. Kemp, 26 Shaftesbury Avenue, London.

WE have received from Mr. Bernard Quaritch, of Grafton Street, New Bond Street, London, W., copies of two of his July catalogues of books. One deals with Oriental history, languages, and literature, and includes works on Oriental art and natural history; the other gives particulars of a large number of books printed during the fifteenth and sixteenth centuries, and is the first part of an illustrated catalogue to be completed in about three parts. The first part, now issued, contains some sixty facsimiles, and comprises examples of xylography in the Low Countries and Italy, and typography in Germany.

OUR ASTRONOMICAL COLUMN.

THE LICK OBSERVATORY ECLIPSE EXPEDITION, JANUARY, 1908.—A very interesting account of the work done, and the preliminary results obtained, by the Lick Observatory-Crocker eclipse expedition to Flint Island, written by Dr. Sebastian Albrecht, appears in No. 3, vol. ii., of the Journal of the Royal Astronomical Society of Canada (pp. 115–131, May–June).

After explaining the importance of the several items in the programme prepared, and describing the various instruments, Dr. Albrecht gives an illustrated description of the eclipse-camp site, and tells of the difficulties overcome in transporting and setting up the several instruments. Errors in the ephemeris-positions of the moon led to totality commencing 27 secs. earlier than predicted, and the observed times of beginning and ending of the total phase were 9h. 22m. 20s. and 9h. 26m. 12s. G.M.T.

The equipment included a coronagraph of 40-ft. focal length, pointed directly at the eclipsed sun, and intended to photograph the details of the inner corona, a shorter instrument for photographing the coronal extensions, several spectrographs, including one with quartz lenses and prisms, two sets of four cameras for seeking any intra-mercurial planet that may exist, polarigraphs, a photometer, and Prof. Abbot's bolometric apparatus.

The photographs taken with the 40-ft. camera show about thirty streamers extending to a distance of more than one solar diameter, and about half that number extending to 1½ diameters; excellent negatives, eight in number, were obtained with the smaller coronagraph. Four good negatives, on which the linear dispersion is such that from λ 3700 to λ 5300 is thirteen inches, were obtained with the large moving-plate spectrograph, and on the one taken at the end of totality there are hundreds of bright lines, the study of which should afford a wealth of information concerning the structure and composition of the sun's higher atmosphere. From one of the smaller-scale spectrograms the wave-length of the green corona line has been determined as 5301·4. Both on these and on the spectrograms obtained with the quartz spectrograph, the shifting of the great intensity of the continuous spectrum towards the red indicates the lower temperature of the corona as compared with that of the photosphere. About twenty-five sharp lines are shown on the coronal spectrograms taken with the quartz instrument, two of which appear to be new. Dr. Perrine's examination of the photographs taken leads to the conclusion that no intra-mercurial planet of sufficient magnitude to account for the Mercury perturbation anomalies exists. Two of the photographs illustrating Dr. Albrecht's article are of the corona.

THE APPROACHING RETURN OF HALLEY'S COMET.—*Popular Astronomy* for May contains an article of general interest on Halley's comet, written by Prof. H. C. Wilson. After describing the comet's appearance at various returns since 1066, the writer compares the approximate elements, reduced to the equinox of 1910, of the orbit at the recorded apparitions from 451 A.D. onwards, and shows that those for 1910 indicate similar conditions to those obtaining in 1066, when the comet was an object of remarkable grandeur. At present the comet appears to be just beyond the orbit of Jupiter, which it should traverse about March 1, 1909, and may possibly be discovered photographically during the coming winter.

THE ORBIT OF ALGOL.—No. 5, vol. i., of the Publications of the Allegheny Observatory is devoted to a discussion of the orbit of Algol, based on observations made in 1906 and 1907 with the Mellon spectrograph; the measurable portion of the spectra extends from λ 3925 to λ 4750, and is 21 mm. in length. In this region eight lines, due respectively to Ca, He, H, Si, and Mg were selected for measurement by Dr. Schlesinger, and were measured by him and Dr. Curtiss independently, adjusted wave-lengths being employed by the latter observer. An apparent change of velocity (about −10 km.) between the observations of 1906 and those of 1907 may be due, possibly, to a change of camera lens, but it is not impossible that it is a real change in the star such as was suspected by Belopolsky. The elements and the light-curve obtained by each observer are given, and the results indicate that the light minimum lags about one and a half or two hours behind the time demanded by the velocity determinations.

THE PATH OF THE MINOR PLANET (279) THULE.—An exhaustive mathematical discussion of the orbit of the minor planet (279) Thule, by Dr. A. Wedemeyer, occupies the fifty-six pages of No. 2, vol. xxxi., of the *Archiv der deutschen Seewarte*. The special perturbations are determined by Oppolzer's method and tabulated, and the corrections derived are applied for each observed opposition of the planet from 1888 to 1906.

AN AMATEUR'S MERIDIAN INSTRUMENT.—In the July number of the *Bulletin de la Société astronomique de France* M. E. Soulié describes a simple and inexpensive apparatus which enables amateur observers to determine the meridian with very fair exactitude. It consists of a flat plate of heavy material, so supported that it hangs vertically like a plumb-line. Using the plane of this sheet to direct the line of sight, the plate is oriented to Polaris some minutes before ζ Ursæ Majoris, or δ Cassiopeiæ, crosses the sight-line. By fine adjustments, the instant when Polaris and one of these stars, preferably the latter, are in the plane of the plate together is noted, and then the plate is made to follow Polaris for exactly six minutes. At the end of this interval it is in the meridian, and may afterwards be used to observe transits or to determine local noon, &c.